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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,402	10/20/2003	Peng Zhang	06412 USA	2570

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EXAMINER

CARRILLO, BIBI SHARIDAN

ART UNIT PAPER NUMBER

1746

DATE MAILED: 09/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/689,402	Applicant(s) ZHANG ET AL.	
	Examiner Sharidan Carrillo	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 25-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-33 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/20/2003</u> | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-24, drawn to a method, classified in class 134, subclass 26.
 - II. Claims 25-33, drawn to a composition, classified in class 510, subclass 175.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product as claimed can be used for a different method such as for use as a developer solution.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Ms. Rosalie Oskanian on 9/13/04 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 25-33 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a semiconductor wafer, does not reasonably provide enablement for any type of substrate. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims embrace an invention which contains any known substrate, which could/can be selected from literally thousands. It does not appear to be feasible that any substrate would function in the present invention. Further, for one skilled in the art to reproduce the present invention (which must be possible, if the specification is adequate), there would clearly be undue experimentation to do so in an attempt to figure out which substrates work and which ones do not.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 11 are indefinite because it is unclear how the given method steps reduce defects. There is no relationship established between the method steps and the preamble. Claims 1 and 11 are indefinite because it is unclear what one of ordinary skill in the art would consider as defects. Page 2 of the specification does not clearly define what those defects are. Claim 14 is indefinite because it is unclear how the surface of the substrate in the contacting step is wet with DI water rinse if claim 11 states rinsing with DI water after the contacting step. Claims 18-20 are indefinite because the process stream lacks positive antecedent basis. Claim 18 is indefinite because it is unclear whether the surfactant is added to the substrate followed by the solvent or whether the surfactant containing the solvent are added to the substrate surface.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-3, 5-20 and 24 rejected under 35 U.S.C. 102(b) as being anticipated by Kakizawa et al. (6310019).

Kakizawa et al. teach a method of cleaning a semiconductor substrate using an

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nonionic surfactant without causing etching of the dielectric silicon oxide or roughness on the surface. In reference to claims 1 and 11, refer to col. 1, lines 23-25, lines 44-45, col. 2, lines 33-35, col. 13, lines 55-60, col. 4 (Formulas 2, 3, 2', 3') and col. 6, Formula 6, and col. 7, lines 20-25. In reference to claims 2-3, and 5-7, refer to col. 11, lines 50—65, col. 8-9 bridging, col. 12, lines 20-35, col. 12, lines 45-50, Example II. In reference to claim 8, Kakizawa et al. teach spraying the solution unto the wafer surface, col. 13, lines 10-13. The limitations of claims 9-10 are properties of the composition and therefore are inherently met by the teachings of the prior art since Kakizawa et al. teach the same composition as the instantly claimed invention. In reference to claims 12-13, refer to col. 13, lines 5-13 which teaches immersion or spraying of the cleaning solution. In reference to claims 14, 18, and 20, refer to Example II. In reference to col. 15, refer to col. 11, lines 40-45. In reference to col. 16, refer to col. 12, lines 34-39. In reference to claim 17, refer to col. 7, lines 21-25. In reference to claim 19, refer to col. 11, lines 38-45. In reference to claim 24, refer to Example II.

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-5, and 7-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US2004/0053800A1)

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The applied reference has a common assignee and inventorship with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Zhang et al. teach process solutions comprising one or more of the claimed surfactants to reduce the number of defects in the manufacture of semiconductor devices.

In reference to claims 1, 8, and 11-14, refer to the Abstract and paragraphs 9, 21, 25, 29, 53, 58, 64, and 65. In reference to claims 2-5 and 7, refer to paragraph 56 and 52. In reference to claim 9, refer to paragraph 39. In reference to claim 10, refer to claim 15 of the prior art. In reference to claims 15-16, refer to paragraph 41. In reference to claims 17-20, refer to paragraphs 62-63. In reference to claims 21-24, refer to paragraph 64.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 4 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakizawa et al. (6310019) in view of Skee (6585825).

Kakizawa et al. teach the invention substantially as claimed with the exception of an oxidizing agent. Kakizawa et al. further fail to teach the specified contact times. Kakizawa et al. teach that other reagents can be incorporated into the cleaning agent of the present invention. Skee et al. teach cleaning the semiconductor wafer using a surfactant solution of acetylenic diol surfactant (i.e. Surfynol, col. 9, lines 28-30, col. 10,

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lines 35-40). In col. 5, lines 57-65, Skee et al. teach a bath stabilizing agent comprising hydrogen peroxide. In col. 9, lines 30-50, Skee et al. teach varying the contact times.

It would have been within the level of the skilled artisan to have modified the method of Kakizawa et al. to include hydrogen peroxide, as taught by Skee et al., for purposes of providing a bath stabilizing agent. Additionally, it would have been within the level of the skilled artisan to vary the contact times depending upon the amount and type of contaminants present on the wafer surface.

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Neisius et al. teach stripping solutions comprising the surfactant. Honda teaches an aqueous rinse solution. Gilton teaches removing organic material from the substrate using a surfactant solution. Skee teaches an alkaline cleaning composition. Moeggenborg et al. and Schroeder et al. teach a CMP composition. Kakizawa teaches a detergent for a semiconductor substrate. Zhang et al. teach a acetylenic diol surfactant. Zhang et al. and Rodney et al. teach a process solution comprising acetylenic diol. Hsu teach a microelectronic cleaning composition. Jiang et al. teach cleaning low k dielectric wafer surfaces. Naghshineh et al. teach cmp cleaning.

19. Applicant is **reminded of their duty to disclose any and all pertinent prior art** since some of the references cited by the examiner and the pending 102(e) rejection have a common inventorship.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on Monday-Friday, 6:00a.m-2:30pm.

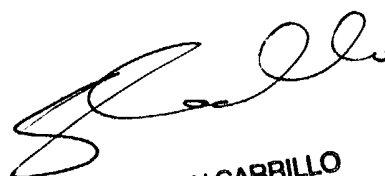
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sharidan Carrillo
Primary Examiner
Art Unit 1746

bsc



SHARIDAN CARRILLO
PRIMARY EXAMINER